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ABSTRACT

This study was based on the assumption that the average person should be able to grasp 14 words of pica type within the span of a half dollar. During the weekly Rapid Reading series, a cooperative venture of CBS-TV and the Northwestern University, a tachistoscopic challenge was presented to the audience. The training in rapid reading came through projecting articles on television, paragraph by paragraph at increasing rates, then asking comprehension questions according to the Reinforced Reading method. The tachistoscopic challenge was used to measure rate and degree of visual awareness up to 14 words in a circular span at 1/50 second. The first 15 people who responded to the feedback appeal averaged a circular span of seven words at 1/50 second. Those who returned progress charts from the self-instructing television workbook averaged 939 words per minute with 79 percent comprehension while reading ninth-grade level materials. The author found the results consistent with the theory that rapid reading training does increase visual awareness of larger spans of print, and that the processing rates can be accelerated without loss of comprehension. However, no definite conclusions were drawn, and further study was recommended. References are included. (AW)

ED 058017

# Abstract

Title: Measuring Degree and Rate of Visual Awareness in Rapid Reading on Television

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Position: Rather than take a polarized position on "speed vs efficiency," a position in which both and a combination of both are appropriate is defined. Moreover, the writer believes reading researchers in the future will concern themselves with studies of multiple search and tachistoscopic tests of subception.

Theory: Scientists reveal that the normal eye can grasp 1.2 inches of print acutely in the horizontal reading span. However, the pupil of the eye is round, which means that the average person can see a diameter of 1.2 inches almost circularly. He therefore should be able to grasp 14 words of pica type within the span of a half dollar.

Practice: During the weekly RAPID READING series, a cooperative venture of CBS-TV and the university, a tachistoscopic challenge was presented to the audience. As far as is known, no one has ever tested word spans encompassing up to 14 words in a circular span. Since the opportunity to innovate a new dimension in such testing with the technological assistance of television experts arose suddenly, the writer informally tested the theory in the time available.

Design: This exploratory study was designed to measure the rate and degree of growth in visual awareness each week. That is, measure the number of words recognized at fast rates. This device, incidentally, was not used as a teaching aid, but as a measuring instrument. The training in rapid reading came through projecting articles on the TV screen paragraph by paragraph at increasing rates; then asking comprehension questions according to the 2R(Reinforced Reading) Method.

Results: The first 15 people who answered the request for audience feedback averaged a circular span of 7 words at 1/50 second. Those who returned progress charts from the self-instructing TV workbook averaged about 1,000 wpm with good comprehension while reading ninth grade level materials.

Conclusions: No definite conclusions can be drawn since training in rapid reading on the TV program did not exceed 1,000 wpm. There may not have been enough training to enable the audience to grasp more than 7 words in the circular span. But the results are sufficient to infer that visual awareness of two dimensional spans can be taught and measured. Further study should be undertaken.

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Title: Measuring Degree and Rate of Visual Awareness During Growth in Rapid Reading on Television

(Combined position paper and exploratory study)

Position: A. Rather than be caught in a "false dilemma" of choosing between two increasingly polarized positions in 1963, the writer chose an eclectic one with regard to rapid reading. Consequently, she devised the 2R(REINFORCED READING) Method which involves both traditional reading and "inclusive skimming."[6] It is not, therefore, a simple paper-back skimming method (implied definition of speed reading.) Nor is it a method confined exclusively to seeing all the words clearly line-by-line in the traditional way (implied definition of efficient reading.) But it is predicated upon development of the entire reading process as defined by W. S. Gray and H. M. Robinson.[5] That includes the five major aspects of reading: word perception, comprehension, assimilation, reaction, including rates of reading (dependent upon and accompanying success in the other four.) Moreover, it emphasizes when to read novel ideas horizontally and when to skim familiar material vertically.

B. Future directions in the study of the rates of reading aspect should include expanded tachistoscopic research with verbal behavior and its implications for rapid reading.

Review of Related Research:

In 1962 polarized positions connoting speed reading vs efficient reading began to emerge. Spache[10] observed the foveal area of the eye is responsible for visual acuity. Previous studies of filmed eye movements revealed fast readers grasp 2 to 3 words per fixation. This is within the 1.2 inches range of central vision. Since clarity falls off quickly in the peripheral area beyond this span, he argued one must see all the words to be considered reading. Moreover, existing studies revealed the average duration of fixations was 1/5 second. He thereupon calculated the physiological limitations of reading faster in the traditional horizontal line-by-line reading. Three words per fixation multiplied by 1/5 second (15 words per sec.) multiplied by 60 seconds per minute are 900 wpm--the estimated maximum.

In contrast, Wood[11] advocated a vertical method based on observations of 15 extraordinary people who seemed to read straight down the center of pages. She vigorously asserted her students were not just skimming but comprehending

what they saw. In 1962 she offered no theory nor controlled research to substantiate her position. But by 1967, Berger[2] conducted a carefully controlled study of paperback scanning (similar vertical method). It supported the claim that adequate comprehension could be grasped if the material had a simple flowing stream of familiar ideas.

In addition, questions about traditional eye movement studies were raised by Guba and Wolf.[3] In 1964 they studied children's eye movements while viewing educational television programs. They reported the eyes moved continuously. Although they did not televise reading materials at this time, their study has implications for discovering new dimensions in vertical and horizontal reading.

A related area in rapid reading focuses on Neisser's[4] research on visual and multiple search. For example, he trained subjects to search 50 line lists of letters for single letter targets, such as, "find the letter 'K' within the list." With training his subjects could find 10 different letters simultaneously. It took no more time than it did to find one letter. He concluded:

> "However, ten targets is not a remarkable number in terms of human cognitive capacity. The experienced readers in a newsclip agency are a case in point. Such a reader can search through the daily paper at over 1,000 wpm, looking for any reference to the agency's clients, of whom there are usually hundreds. The feasibility of multiple search in such a practical context suggests that our own results are not due to artifacts or to demand characteristics." (p 70-71)

Examination of experiments in "forced choice" and subception also suggest future directions. Referring to Lazarus and McCleary's work (1951), Neisser defines subception as (p. 129): "the subject's use of information obtained from a subthreshold tachistoscopic exposure." For an autonomic response within a subject, a conditioned stimulus was paired repeatedly to an electric shock (GSR or galvanic skin response.) Lazarus and McCleary conditioned the GSR to 5 nonsense words and tested subjects for subthreshold responses with the tachistoscope. The accurate recognition of the stimuli amid non-stimulus words was immediate.

"Forced choice" procedures were studied by Worthington and Dixon.[12] Items were flashed tachistoscopically so quickly and dimly that subjects insisted they saw nothing. But when forced to guess among choices of words, their responses were more accurate than mere chance.

With regard to rapid tachistoscopic exposures of this nature, a comment

was made that after-images might interfere if a person read that quickly. In laboratory experiments, each flash is usually followed by a time lapse, and continuous reading is not projected. To this the writer would call attention to the fact that each movie frame is shown on the screen at 1/24 second. People have little trouble comprehending the merging pictures. Adler implies the after-images can be wiped out at will, when fixing attention on new stimuli.[1]

Although Neisser had reservations about forced choice, he concluded that verbal presentations of an entirely familiar word tachistoscopically at high rates is possible and within the theoretical framework of visual synthesis and verbal memory. But he says,

> "reading for meaning, we continuously take account of new constellations of words to construct novel thought processes." (p. 136.)
>
> For the present, therefore, "rapid reading represents an achievement as impossible in theory as it is commonplace is practice."

Theoretical Definitions:

From the preceding research and statements, it should be obvious that rapid reading is not intended for materials which, to the reader, are novel, highly technical, poetical, or evocative to creative thought. The point Neisser and others seem to be overlooking, however, is it is appropriate for straightforward informational materials which are highly FAMILIAR to the reader.

Rapid reading becomes theoretically possible within that same framework of visual synthesis and verbal memory mentioned above when the following four mechanisms are operating fully within the trained reader:

1. FAMILIARITY with the content
2. ANTICIPATION of the linguistic structure
3. VISUAL AWARENESS of adequate cues
4. SYNTHESIS of complete meaning from these cues.

During rapid reading of familiar materials, the reader can anticipate the structural flow of the author's thought based upon his experience with the language itself. However, he must be trained to be aware of grammatical cues as well as more words within his span of visual acuity. Finally, he must be able to synthesize what he sees into meaningful patterns and react to them.

In addition, there are three aspects of human perception which may inter-

mingle and control rapid reading by degrees, depending upon the variable of the situation. These perceptive aspects are the:

1. physical (visual unless one is blind)
2. emotional (studies of perceptual defense reveal taboo words alter conscious thresholds)
3. cognitive (comprehension)

Spache clearly addressed his limitatins of traditional horizontal reading rates to the physical aspect of perception. And it is quite appropriate for the controlling variables. Most people would do well to grasp meaning or satisfaction at rates as fast as 900 wpm if reading unfamiliar or poetical materials. These demand a high degree of reinforcement from inner speech. That also means one must be able to see words clearly in order to say many of them. Thus the KEY FACTOR to traditional rapid reading is the need to follow sequenced patterns of speech, often at average "look and say" rates, 1/5 second per fixation.

On the other hand, there is another dimension to the physical limitations of the eye which affect vertical skimming. As stated earlier, scientists reveal the normal eye can grasp 1.2 inches of print in the horizontal reading span. In 1965 the writer observed the pupil of the eye is round which means that the average person can see a diameter of 1.2 inches almost circularly.[7] He, therefore, should be able to grasp 14 words of pica type within the span of a half dollar. That means that if a person could be trained to skim vertically the familiar content in narrow newspaper columns, taking up to 14 words a fixation (seeing a 2 to 3 line unit simultaneously) at 1/5 second, his rate might be 4,200 wpm. And physiologically he could be seeing all the words! If his rate is less than 1/5 second, as gifted readers find, his rates might seem incredible by traditional standards. But the gifted succeed only under ideal and limited conditions.[9]

For at least 95 percent of the population most of the time, however, the question is, even if a person does see all the words in an elliptical span, can he synthesize what he sees meaningfully? Physical perception alone is not the controlling factor in rapid reading. It must be accompanied by cognitive perception.

Exploratory TV Study: During the weekly RAPID READING series, a cooperative venture of the Community Relations Department of CBS-TV in Chicago and the university, a tachistoscopic challenge was presented to the audience along with attempts to increase their reading rates to 1,000 wpm with good comprehension on continuous texts. This was the first time circular spans of words were flashed on a TV screen or any screen, as far as is known. Unfortunately, the opportunity to innovate this program came suddenly, and there was not time to do a controlled study.

Purpose of T-scopic Challenge: to measure rate and degree of visual awareness. That is, to measure the number of words (up to 14 words in a circular span) at 1/50 second.

The Audience: The first fifteen people who responded to the appeal for feedback on the tachistoscopic test and who returned progress charts from the RAPID REINFORCED READING MANUAL. They ranged in age from 12 to 73 years. The average was 40 years and they were two-thirds male.

Design of Study: Each week the number of words flashed on the TV screen at 1/50 second increased until a sentence of 14 words appeared within the span of a half dollar, the theoretical physical limit of visual acuity in reading. The concepts were familiar. This device, incidentally, was not used as a teaching aid, but as a MEASURING INSTRUMENT. The training in rapid reading came through projecting articles on the TV screen paragraph by paragraph at increased rates, then asking comprehension questions according to the 2R(REINFORCED READING) Method.

Results and Tentative Conclusions: The average person could grasp up to 7 word sentences (on familiar topics) in a circular span at 1/50 second, as such:

It is
easy to
grasp this
span.

This is consistent with the theory--rapid reading training does increase visual awareness of larger spans of print; and rates of processing these spans can be accelerated without loss of comprehension, provided the patterns of print are familiar. However, the dramatic potential for reading rates suggested by theory and fact on these tachistoscopic tests was not realized in the actual reading situations. The progress charts returned by those who sent for and completed

the self-instructing RAPID READING KIT revealed the average person almost achieved the goal of the course. He began reading 9th grade reading level material (PSYCHO-CYBERNETICS by Maltz) at 350 wpm with 67 percent comprehension and finished with 939 wpm with 79 percent. With the help of a live teacher and deliberate training beyond 1,000 wpm perhaps larger gains could be made. It warrants further investigation. Although this study is too limited for definite conclusions to be drawn, the gap between theory and practice probably will remain distant for all but the gifted for quite awhile.

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